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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hans-Martin Wiedenmann

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EXAMINER

SALZMAN, KOURTNEY R

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

06/16/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/510,397	Applicant(s) WIEDENMANN ET AL.	
	Examiner KOURTNEY R. SALZMAN	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on June 1, 2010 has been entered.

Summary

2. Claims 8 and 17-19 have been amended.
3. Claims 8-21 remain pending and have been fully considered.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 8-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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a. Claims 8 and 17-19 have been amended to recite "the duration a post fuel injection". There is no support for the terminology "post fuel injection". The only fuel injection process referred to in the specification is the "secondary fuel injection" which was removed in favor of the new terminology. There is no support and therefore no description of what this terminology is to mean within the specification. For the purpose of this action, "the duration of a post fuel injection" is interpreted as the time following a fuel injection; however this is simply in the interest of compact prosecution and will not remain the interpretation in further actions unless otherwise directed.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 8-21 are rejected under 35 U.S.C. 103(a) as being obvious over LENFERS et al (DE 198 38 466, rejections are based on US 6301951 as the English equivalent to this document) and CARNAHAN et al (US 3,768,259).

Regarding the preamble of claim 8, LENFERS et al teaches an oxygen sensor in an exhaust engine, as stated in the abstract. LENFERS et al teaches in the only figure a Nernst cell (12) with a measurement electrode (16) and reference electrode (18) contained in the reference canal (30). The pump cell (14) has an outer electrode (40) and inner electrode (38) separated from the exhaust gas by the diffusion barrier (22).

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Regarding claim 8 limitations, LENFERS et al teaches the application of voltage to a pump cell in c. 3, l. 40-42 (of the English translation of LENFERS et al).

LENFERS et al states the pump voltage being cathodic or anodic to correspond to the lean or rich range of fuel-air ratio in c. 3, l. 42-45, citing cathodic current during lean operation in c. 3, l. 67 – c. 4, l. 1. This obviously causes anodic current to flow during rich operation. LENFERS et al teaches a rich drift to occur during lean conditions (c. 3, l. 67 – c. 4, l. 9) which is offset by reverse polarity pulses of the pump voltage in c. 4, l. 18-26.

LENFERS et al fails to teach the engine to be in lean operation during time following a fuel injection.

CARNAHAN et al teaches a system or method for controlling engine exhaust comprising the known use of fuel injection during long term lean operation to maintain a lean range of air-fuel ratio in column 3, lines 33-46.

Because LENFERS teaches that the reverse polarity pulses eliminates polarity on the electrodes during extended periods of lean operation (c. 4, l. 44-47), then it would have been obvious to one possessing ordinary skill in the art at the time the invention was being made to also utilize these pulses during other extended periods of lean operation, such as the following or during the application of a fuel injection to maintain lean operation like shown by CARNAHAN et al, so as to

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prevent the polarization of the electrodes during these other lean operations as well.

Regarding claim 9, LENFERS et al explains in c. 3, l. 59-67 that while the pump voltage is at a constant amplitude, a timer responds with a signal. The timer controls the pulse width, via the switching means, before reversal of polarity provided. (c. 4, l. 20)

Regarding claim 10, LENFERS et al teaches in column 4, lines 26-32 the time ranges and pulse applications to be dependent on the voltage. Therefore, if the pulse time is set, the voltage would need to vary, to maintain accurate readings.

Regarding claims 11-16, the manipulation of the frequencies are said to be variable in column 4, lines 32-36 of LENFERS et al. Therefore, it would be obvious to one of ordinary skill in the art to operate the pulses with a frequency which will best depolarize the electrode, decreasing the rich drift.

Regarding claims 17-19, it would be obvious to one of ordinary skill in the art for the temperature of the engine and in turn the exhaust gases and sensor to increase in temperature following fuel injection as it is well known in the art for a mixture which is too lean to run hotter as it gets leaner. Therefore as the time

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becomes greater since the last fuel injection and the mixture becomes leaner, the engine will run hotter or increase in temperature.

Regarding claims 20 and 21, LENFERS et al teaches in claims 4 and 6 for the reversal of polarity to occur during predominate anodic currents (rich operation as defined in the above rejection of claim 8) in claim 4 and cathodic currents (lean operation as defined in the above rejection of claim 8) in claim 6. It would be obvious for operation to continue during both operation conditions.

Response to Arguments

8. Applicant's arguments with respect to claims 8-21 have been considered but are moot in view of the new ground(s) of rejection.

b. The arguments submitted by the applicant are to the previously applied references not addressing the current amendment. The addition of CARNAHAN et al in place of EICHLER et al remedies these deficiencies.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KOURTNEY R. SALZMAN whose telephone number is (571)270-5117. The examiner can normally be reached on Monday to Thursday 6:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

krs
6/11/2010